

Earth System Science in Pre-service
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Abstract

Being known that the GLOBE Program is a worldwide hands-on and minds-on school-based Earth System Science Education program. The teacher plays an important role on encouraging the students in doing GLOBE activities. The pre-service teacher preparation for earth system science education is the valuable and sustainable strategy for GLOBE successful implementation.

To promote the integration of earth system science into pre-service program for teacher preparation, the Institute for the Promotion of Teaching Science and Technology (IPST) has started to make collaboration efforts arranging the first workshop for 10 concerned universities to introduce the philosophical value of earth system science pre-service integration. The second workshop was conducted among 10 pre-service universities (eight universities from the first workshop and two new universities) to carefully analyze the existing related courses and seeking for the possibility of adapting those courses or designing the new courses. Moreover, the Earth System Science Teacher Guide and Student Activities, innovated by IPST, were introduced to 10 active pre-service universities to be adopted for successful implementation. The third workshop for sharing the successful try-out models among active pre-service universities will be arranged in the year 2008.

Introduction

The GLOBE Program is a worldwide hands-on, minds-on, primary and secondary school-based Earth System Science Education program. GLOBE philosophy and sustainable strategies can help fulfilling the goals of inspiring the next generation of citizen scientists. The student higher order of thinking, scientific attitude, and scientific inquiry skills are enhanced to be able to understand earth system science concepts and help solving local and global environmental problems.

To achieve the above agreeable goals of National Science Education Standard (NSES) and GLOBE Earth System Science Education, IPST has developed the Earth System Science Teacher Guide and Student Activities for schools to train the teachers and students. Pre-service is another valuable implementation.

Earth System Science in Pre-service

To encourage the integrating earth system science into pre-service program, IPST has conducted the first pre-service education workshop for 10 concerned universities to introduce the philosophical value of earth system science pre-service integration on September, 18 – 19, 2006 and arranged the second pre-service education workshop

among 10 pre-service universities (eight universities from the first workshop and two new universities) to carefully analyze the existing related courses and seeking for the possibility of adapting those courses or designing the new courses on February 21 – 23, 2007. After the workshops, all universities indicated strong intention in adopting earth system science concepts into pre-service education. IPST has provided support to the universities to strengthen their understanding of earth system science, demonstrate the ability of integrating earth system science into their curriculums, and provide the innovative earth system science course designing models. “The Earth System Science Teacher Guide and Student Learning Activities” innovated by IPST was introduced to active pre-service universities as the guide line for integrating or designing earth system science pre-service courses. It was found that the collaboration efforts between the Faculty of Science and the Faculty of Education are also the major successful implementation strategies.



The Pictures from the Workshops!

There have been a variety of integrated implantation models. The universities have integrated earth system science concepts and student learning activities into pre-service education in 3 models as follows:

1. The universities have integrated earth system science concepts and learning activities into their related existing courses such as earth system constituent, earth system cycle, earth system and atmospheric change, etc.
2. The universities have established a new earth system science course.
3. The universities have arranged short courses of earth system science in summer for their pre-service teachers.

Future Implementation Plan

For the future implementation plan, we are planning to do the following activities:

1. Providing necessary financial support for earth system science implementation activities of active pre-service universities as requested.
2. Offering academic supports such as:
 - Example of successful models for earth system science implementation into pre-service education program eg. The GLOBE Pre-service Toolkit (July 2005) (Source: GPO)
(http://globethailand.ipst.ac.th/Preservice/pre-service_toolkit.pdf)
 - Designing Earth System Course
(<http://serc.carleton.edu/introgeo/earthsystem/index.html>)
3. Joining and follow-up earth system science training activities of the active pre-service universities.
4. Designing successful and practical earth system science implementation models by arranging the third workshop for sharing the successful try-out models among active pre-service universities.
5. Arranging the third pre-service education workshop for sharing successful implementation models and experience with the new pre-service universities.